

FACT SHEET FOR NPDES PERMIT WA-000087-6

Kaiser Aluminum and Chemical Corporation, Mead Works

SUMMARY

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—Response to Comments.

GENERAL INFORMATION	
Applicant	Kaiser Aluminum & Chemical Corporation, Mead Works
Facility Name and Address	Kaiser Aluminum & Chemical Corporation, Mead Works East 2111 Hawthorne Road Mead, WA 99021
Type of Facility:	Primary Aluminum Smelting & Coke Calciner
SIC Code	SIC Code 3334 & SIC Code 2999
Discharge Location	Waterbody name: Deadman Creek Latitude: 47° 46' 48" N Longitude: 117° 20' 06" W.
Water Body ID Number	24-55-02

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The plant was constructed in 1942 in support of the war effort and was originally owned by the Department of Defense. Following World War II, Henry J. Kaiser leased the plant in 1946 and subsequently purchased it in 1949. As originally constructed, the plant had just six Potlines and three Carbon Baking Furnaces. Two additional potlines were added to the plant during this decade. All eight potlines were completely hooded and wet scrubbers were added to scrub the fumes collected from the cells. During the 1970's the wet scrubbers were replaced with dry alumina scrubbers. In the 1980's Kaiser added computerized controls to the potrooms. In 1997 Kaiser installed a new carbon baking furnace.

INDUSTRIAL PROCESS

The Kaiser Mead North Plant manufactures molten aluminum metal from alumina ore. The main plant carries out both the aluminum reduction process and the carbon anode manufacturing process; the latter process produces the carbon anodes used in the aluminum reduction process.

The Hall-Heroult aluminum reduction process is used at the plant. Alumina dissolves in the molten bath of fluoride salts in a cell, and electrical current is passed through the molten mixture. This causes the alumina in the cell to be chemically reduced to aluminum, which then collects at the bottom of the cell. The molten aluminum is periodically tapped from the cells and transferred to either larger transfer crucibles for transport via truck off site, or to molds used to form 1,000-pound ingots for later transport off site. The plant contains eight potlines of 1,135 center worked, pre-bake reduction cells.

The other major process conducted at the main plant is carbon anode manufacturing. The anodes are manufactured from a paste mix of calcined coke and a byproduct from steel production called pitch. The paste ingredients are batch-mixed in large steam-heated paddle mixers and pressed into blocks using one of three large hydraulic press systems. The pressed blocks are cooled in an anode block spray cooling chamber. Originally, the anode cooling water was discharged from the plant through the outfall. On November 22, 1989, a closed-loop anode cooling system was installed, which eliminated discharge of water in direct contact with the anode blocks. The cooled blocks are then transferred to large furnaces where they are baked. Following baking, a conductive copper rod and steel stub assembly is installed in each block using molten iron to cement the assembly into the carbon block. An electromelt furnace is used to melt the iron that is used for the rod installation. Then the finished anodes are ready to be used in the aluminum reduction cells. Each reduction cell contains 24 anodes. This process does not have any contact wastewater discharges.

Wastewater produced at the site is from process non-contact cooling, compressor and other machinery cooling, boilers, courtyard spray, domestic sewage plant, and storm runoff. The industrial and storm water is combined with treated sanitary wastewater in a manhole near a

small sanitary treatment plant. The various water sources combine prior to reaching the settling basin (260 feet in length, 110 feet in width, and 15 feet deep). At the approximate existing average dry weather flow rate of 2.9 MGD, the settling basin has a hydraulic retention time of 11 hours based on the design capacity of the basin. However, the basin's actual capacity is much less than the design capacity because of the settled solids accumulation at the bottom of the basin. The actual retention time of the basin is about 5 hours at flow rate of 2.9 MGD. During higher storm events and higher settled solids accumulated at bottom of the basin, the retention time of the basin could be as low as two hours.

The Kaiser Mead South Plant contains a coke calciner process. A rotary kiln is used to heat (calcine) the coke for moisture and organics reduction. Offgas from the rotary kiln is controlled by an air emission control system for reducing organics, sulfur dioxide, and particulate emissions. This process does not have any contact wastewater discharges.

Discharge Outfall

Outfall 001 is located approximately 400 feet south of the Highway No 2 bridge over Deadman Creek. The discharge from the settling basin enters a 42-inch pipe and flows approximately two miles north to Deadman Creek. The outfall discharges at the side of the creek. In the vicinity of the outfall 001 discharge, the Creek is about 15-20 feet wide and 1-3 feet deep. It was estimated that low flows in Deadman Creek are approximately 3 to 3.5 MGD during Ecology's October water inspections this year. In the past, the outfall 001 discharge has been in the range of 2 to 5 MGD. Without stormwater, the discharge is in the range of 2 to 3 MGD.

The sanitary plant has design capacity of 0.18 MGD. Its discharge is in the range of 0.03 to 0.10 MGD. The sanitary plant effluent is combined with industrial wastewater before entering the settling pond.

PERMIT STATUS

The previous permit for this facility was issued on January 31, 1990 and modified on February 14, 1992. The previous permit placed effluent limitations as follows:

TABLE 1 EFFLUENT LIMITATIONS: 001 OUTFALL

Parameter	Unit	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type
Total Suspended Solid (TSS)	lbs/day	120	681	Daily	24 hr comp
Fluoride*	lbs/day mg/l	106 4.0	765	Daily Daily	24 hr comp 24 hr comp
Aluminum	lbs/day	N/A	N/A	Daily	24 hr comp
Free Cyanide	mg/l	0.003	0.008	Daily	24 hr comp

Oil and Grease	mg/l	--	10.0	Daily	Grab
Benzo(a)Pyrene	mg/l	--	--	Weekly	24 hr comp
Chlorine	mg/l	0.007	0.018	Continuous	Continuous
pH		Min. 6.5	Max. 8.5	Continuous	Continuous
Temperature	F	--	--	Continuous	Continuous
Flow	mgd	--	--	Continuous	Continuous
Production	tons/day	--	--	Daily Avg.	Continuous
Precipitation	in./day	--	--	Daily	Continuous

* A consecutive 120-day rolling average is calculated for compliance with this limit.

Table 2 Effluent Limitations: Sanitary Treatment Plant Discharge

Parameter	Unit	30-Day Average	7-Day Average	Monitoring Frequency	Sample Type
Biochemical Oxygen Demand	mg/l lbs/day	25.0 40	45.0 70	Weekly Weekly	24 hr comp 24 hr comp
Total Suspended Solid (TSS)	mg/l lbs/day	30.0 50	45.0 70	Daily Daily	24 hr comp 24 hr comp
Fecal Coliform	#/100 ml	200	400	Weekly	Grab
Residual Chlorine	mg/l	0.1 Daily Min.	2.0 Daily Max.	Daily	Grab
pH		6.0 Daily Min.	9.0 Daily Max.	Daily	Grab
Flow	MGD	--	--	continuous	continuous

An application for permit renewal was submitted to the Department on October 17, 1994 and accepted by the Department on August 20, 1996.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received a Class 1 inspection on June 29, 1999. A Class 2 inspection with sampling was conducted on May 12, 1999. EPA conducted a multimedia inspection on June 11, 1996 that indicated Kaiser needed to improve lab quality control. Based on EPA's QA/QC comments, Kaiser has revised their QA/QC procedures.

During the history of the previous permit, the Permittee has had several violations of the NPDES Permit. Kaiser has compliance problems with the TSS and pH limits at the settling pond

discharge. There were violations of low residual chlorine and high fecal coliform count in the sanitary plant discharge, and high chlorine concentration in settling pond effluent. Enforcement actions have been taken for these exceptions.

WASTEWATER CHARACTERIZATION

The proposed wastewater discharge is characterized (long term average) for the following regulated parameters:

Table 3: Wastewater Characterization of 001 Outfall

Parameter	Concentration, mg/l (lbs/day)	
TSS	2.7	(68.4)
Aluminum	0.5	(12.0)
Fluoride	1.5	(38.2)
Antimony	<.02	-----
Chromium	0.003	(0.74)
Copper	0.009	(0.22)
Nickel	0.004	(0.10)
Zinc	0.059	(1.45)
Cyanide	0.00004	(0.00)
Benzo(a)Pyrene	0.0	(0.00)
BOD	<10, Maximum Daily	
Chlorine Residual	0.0	(0.00)
Oil & Grease	0.4	(16.4)

Kaiser's expired NPDES permit required Kaiser to conduct several studies. One important study was the "Discharge Water Study and Pollutant Discharge Reduction/Elimination Study" dated August 1994. In this study, aluminum (alumina) was found to be present in the Kaiser effluent primarily as a suspended solid. Technologies to remove suspended solids from wastewater include filtration, sedimentation, and coagulation/sedimentation have been discussed.

The study has also discussed improvements to settling basin operation. The operation of the settling basin could be improved by constructing a new cooling water line from the major users of cooling water to the outlet of the settling basin. By bypassing the settling basin in this way, the sedimentation effectiveness of the basin would be increased, even during wet weather conditions, and the overall pollutant loading to Deadman Creek would be reduced.

For improving the effectiveness of settling at the basin, this study suggests coagulating the fine particles using a coagulant such as ferric chloride or alum. This process can be very effective in removing suspended solids from wastewater. The bypassing and coagulation are most effective when combined into one due to their interdependence. If coagulation were introduced without

the cooling water revision, a much higher chemical treatment rate would be required. If the cooling water revisions (bypassing) were implemented without coagulation, the improvement in sedimentation efficiency would be reduced.

SEPA COMPLIANCE

This permit renewal has no SEPA compliance issues.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis and the limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported and they are not controllable at the source and they don't have a reasonable potential to cause a water quality violation. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The Department reviewed the applicant's Form R (Toxic Release Inventory Reporting Form) list of Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III hazardous substances and Form 2C of the NPDES Permit Application. The Department also reviewed the discharge monitoring reports (DMR), study results, and waste water inspection results generated during the term of the previous permit.

Best Professional Judgment (BPJ) was used in establishing effluent limitations in this permit for toxic, nonconventional, and conventional pollutants. Kaiser does not have any wastewater discharge contained in 40 CFR Part 421, Subpart B. The previous permit placed limits that were more stringent than the categorical standards and are therefore placed in this permit as well.

Kaiser treats TSS from their wastewater in a sedimentation pond. During the dry season, this pond can treat wastewater without any exceedances. TSS discharges from this pond are typically below BPT treatability levels during the high stormwater events.

The monthly reports for total suspended solids (TSS) and fluoride data of past three years indicate that the reported data are close to the permit limits. Therefore, the TSS and fluoride limits will remain unchanged from the previous permit. Kaiser should be able to meet the limits under normal wastewater flow rate conditions. When stormwater events occur and increase the amount of wastewater entering the settling basin, Kaiser may not be able to meet the limits due to the low retention time of the basin.

The Department issued an administrative Order (DE 98 WQ- I064) to Kaiser on January 13, 1999. The Order requires Kaiser to improve its wastewater/stormwater treatment in order to eliminate or reduce pH and TSS permit excursions.

A limit for aluminum was not included in the previous permit. After reviewing Kaiser's Discharge Water Study and Pollutant Discharge Reduction/Elimination Study and the discharge monitoring reports, the Department decided that the daily maximum limit for aluminum should be 122 pounds per day and the monthly average limit should be 21 pounds per day. The aluminum limits were based on the relationship of aluminum to TSS, existing TSS monitoring data (1996-1997), and existing aluminum monitoring data (1996-1997). The two-year average of TSS daily maximum and monthly average are 439.1 and 63.27 pounds per day, respectively. The two-year average of aluminum daily maximum and monthly average are 78.47 and 10.91 pounds per day, respectively. Based on these data, the aluminum DM limit (122) is equivalent to 681 times 78.47, and divided by 439.1. The same calculation is applied to the aluminum MA limit.

Cyanide monitoring is required because of the presence of cyanide in wastes generated and stored on site. A mass effluent limitation is not required because cyanide has not been detected from previous effluent testing and is not an expected component of Kaiser's wastewater discharge.

The pH limits (6.5 to 8.5) with a man-caused variation within a range of less than 0.5 unit remain unchanged from the previous permit. This limitation is based on water quality standards from Chapter 173-201 WAC.

The oil and grease limit is concentration based and remains unchanged from the previous permit.

Historically, Kaiser had benzo(a)pyrene (B(a)P) effluent limitations from the anode contact cooling water found in a subcategory in 40 CFR Part 421 Subpart B. Kaiser has already eliminated this source, however, Kaiser will continue to have a periodic effluent monitoring requirement for B(a)P.

Effluent limits from the sanitary treatment plant will be the same except the residual chlorine limit. The limit will be based on average 7-day maximum instead of daily maximum for better control of algae at the chlorine contact chamber.

Most discharge limitations unchanged from the previous permit because Ecology claims that Kaiser's current wastewater treatment system is not AKART.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-

201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria. The Department of Ecology does not authorize Kaiser a mixing zone because the receiving water is too small according to the requirements of WAC 173-201A-100.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Deadman Creek that is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units

Turbidity	less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

Acute toxicity was measured during effluent characterization in the previous permit term. Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. Since there is no dilution zone assigned to this facility, the acute toxicity limit is no statistically significant difference in test organism survival in a 100% effluent concentration, and the control.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of 100% effluent and comparing test organism survival in the 100% effluent concentration to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the 100% effluent concentration and the control.

If the Permittee makes process or material changes which, in the Department's opinion, results in a change in the potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal.

Chronic toxicity was also measured during effluent characterization in the previous permit term. This toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. A chronic toxicity limit is therefore required. Since there is no dilution zone assigned to this facility, the chronic toxicity limit is no statistically significant difference in test organism response between 100% effluent concentration and a nontoxic control.

Monitoring for compliance with a chronic toxicity limit is accomplished by conducting a chronic toxicity test using a sample of 100% effluent and comparing the test organism to organism response in nontoxic control water. The Permittee is in compliance with the chronic toxicity limit if there is no statistically significant difference in test organism response between the 100% effluent concentration and the control.

If the Permittee makes process or material changes which, in the Department's opinion, results in a change in potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on knowledge of data or process information indicating regulated chemicals occur in the discharge.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted November 21, 1996 as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The initial calculation indicated that the discharger may have a reasonable potential to cause a violation of water quality standards for nickel, chromium, copper and zinc. Further analyses of these four metals conducted on January 1, 1997 indicate that none of these four metals will exceed the water quality standards.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. The Department has reviewed the results of the Kaiser Aluminum Baseline Sediment Study Report (February 1994). Two stations (A-1 and C-1) addressed in the report showed potential biological hits. Two stations (A-1 and A-2) showed potential for heavy metal and/or organic contamination of sediments in the stream. Therefore, additional sediment sampling and analysis becomes necessary.

TURF FARM

In 1997, Kaiser had a turf farm project which was related to the Department's "Pollutant Reduction/Elimination Plan". The turf farm is located next to the settling basin on the north side of the smelter. The farm has a size of 160 acres and it started to operate in the summer of 1998. The water used for irrigation is from the settling basin. The irrigation can reuse up to 50 percent of the plant discharge water during the hottest months of the summer.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

The Department believes the Permittee's discharge does not have the potential to cause a violation of the Ground Water Quality Standards.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED

Parameter	Limits with the Existing Permit	Limits with proposed Permit
TSS, lbs/day	120 Mon. Average, 681 Daily Max.	Same as existing
Fluoride, lbs/day mg/l	106 (120 d. ro) Average, 765 Daily Max. 4.0 (120 day rolling) Average	Same as existing
Aluminum, lbs/day	No limits	21 Mon. Average, 122 Daily Max.
Free Cyanide mg/l	0.003 Mon. Average, 0.008 Daily Max.	Same as existing
Oil & Grease mg/l	10.0 Daily Max.	Same as existing
Chlorine, mg/l	0.007 Mon. Average, 0.018 Daily Max.	Same as existing
pH	Min. 6.5 and Max. 8.5	Same as existing

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.1. Specified monitoring frequencies, effluent limitations, and sampling types.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S4 are based on the authority to specify any appropriate reporting and record-keeping requirements to prevent and control waste discharges (WAC 173-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee develop a solid waste plan to prevent solid waste from causing pollution of waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual will be submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations that are described in the rest of this fact sheet.

The Department will publish a Public Notice of Draft (PNOD) on August 12, 1999 in the Spokane Spokesman Review to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the office listed below. Written comments should be mailed to:

Bob King, Permit Manager
Department of Ecology
Industrial Section
P.O. Box 47706
Olympia, WA 98504-7706

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART—An acronym for “all known, available, and reasonable methods of treatment”.

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine—Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity—The effect of a compound on an organism over a relatively long time, often 1/10 of an organism’s lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be “time-composite”(collected at constant time intervals) or “flow-proportional” (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity—Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Daily Maximum Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Dilution Factor—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility—A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility—A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

Monthly Average—The average of the measured values obtained over a calendar month's time.

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

APPENDIX D—RESPONSE TO COMMENTS